Kramer Electronics, Ltd.

USER MANUAL

Model:

FC-113

HDMI to SD/HD-SDI Converter

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Thank you for purchasing the Kramer DigiTOOLS® **FC-113** *HDMI to SD/HD-SDI Converter,* which is ideal for:

- Home theater, presentation and multimedia applications
- Rental and staging

The package includes the following items:

- **FC-113**
- Power supply (5V DC input)
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high-performance high-resolution cables[3]

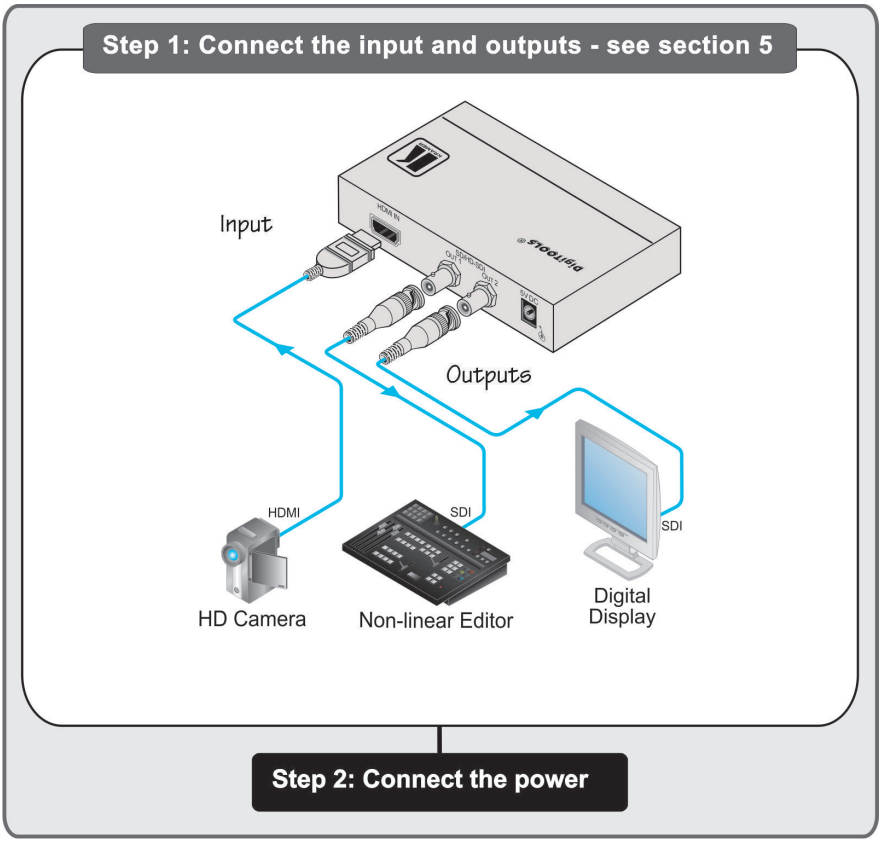
1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

2 Download up-to-date Kramer user manuals from http://www.kramerelectronics.com

3 The complete list of Kramer cables is available from http://www.kramerelectronics.com

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.



3 Overview

The **FC-113** *HDMI to SD/HD-SDI Converter* is a high-performance format converter for SDI (SMPTE 259M), HD-SDI (SMPTE 292M), and 3G HD-SDI (SMPTE 424M) signals. It converts an HDMI input to two identical SDI video with embedded audio output signals. The **FC-113** does not perform frame rate or resolution conversion[1].

1 It has to receive an HD or SD signal to convert it to SD/HD-SDI signals

The **FC-113** features:

- One HDMI input
- Two SD/HD-SDI/3G HD-SDI outputs on BNC connectors
- HDTV compatibility
- Active LED indicators on the front panel. Green indicates a standard (SDI) definition and blue indicates a (HD-SDI) high-definition input signal
- 5V DC power

3.1 About HDMI

High-Definition Multimedia Interface (HDMI) is an uncompressed all-digital[1] audio/video interface, widely supported in the entertainment and home cinema industry. It delivers the highest high-definition image and sound quality. Note that Kramer Electronics Limited is an HDMI Adopter and an HDCP Licensee.

In particular, HDMI[2]:

- Provides a simple[3] interface between any audio/video source, such as a set-top box, DVD player, or A/V receiver and video monitor, such as a digital flat LCD / plasma television (DTV), over a single[4] cable
- Supports standard, enhanced, high-definition video, and multi-channel digital audio[5] on a single cable
- Transmits all ATSC HDTV standards and supports 8-channel digital audio, with bandwidth to spare to accommodate future enhancements and requirements
- Benefits consumers by providing superior, uncompressed High Definition digital video via a single cable[6], and user-friendly connector
- Is backward-compatible with DVI (Digital Visual Interface)

1 Ensuring an all-digital rendering of video without the losses associated with analog interfaces and their unnecessary digital-to-analog conversions

2 HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI licensing LLC

3 With video and multi-channel audio combined into a single cable, the cost, complexity, and confusion of multiple cables currently used in A/V systems is reduced

4 HDMI technology has been designed to use standard copper cable construction at up to 15m

5 HDMI supports multiple audio formats, from standard stereo to multi-channel surround-sound. HDMI has the capacity to support Dolby 5.1 audio and high-resolution audio formats

6 HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner

- Supports two-way communication between the video source (such as a DVD player) and the digital television, enabling new functionality such as automatic configuration and one-button play

HDMI has the capacity to support existing high-definition video formats (720p, 1080i, and 1080p @60), as well as standard definition formats such as NTSC or PAL.

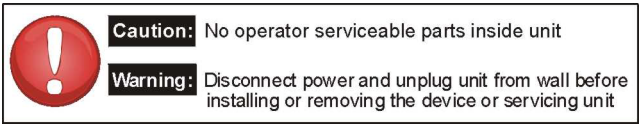
3.2 About HDCP

The High-Bandwidth Digital Content Protection (HDCP) standard[1], protects digital video and audio signals transmitted over DVI or HDMI connections between two HDCP-enabled devices to eliminate the reproduction of copyrighted material. To protect copyright holders (such as movie studios) from having their programs copied and shared, the HDCP standard provides for the secure and encrypted transmission of digital signals[2].

3.3 Recommendations for Best Performance

To achieve the best performance:

- Use only good quality connection cables[3] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **FC-113** away from moisture, excessive sunlight and dust


Caution:
No operator serviceable parts inside unit
Warning:
Disconnect power and unplug unit from wall before installing or removing the device or servicing unit

1 Developed by Intel

2 It is illegal to convert the input signal to HD-SDI

3 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

4 Defining the FC-113 HDMI to SD/HD-SDI Converter

Figure 1 and Table 1 define the **FC-113** *HDMI to SD/HD-SDI Converter.*

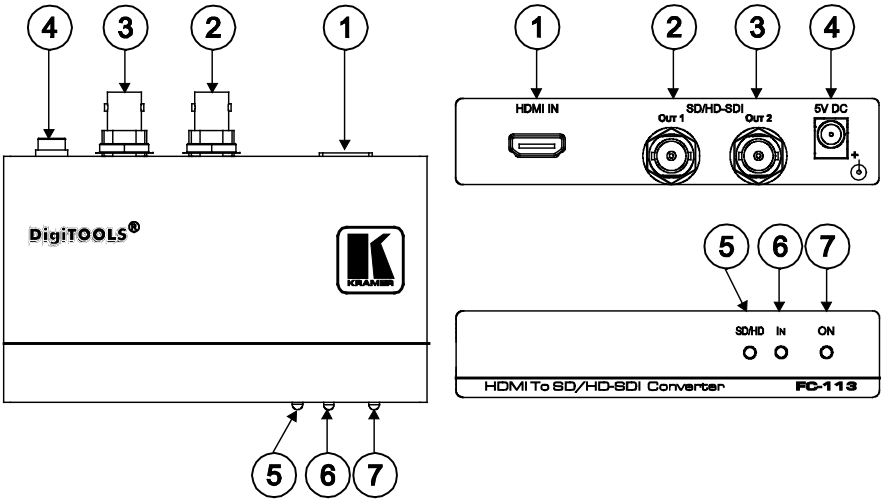


Figure 1: FC-113 HDMI to SD/HD-SDI Converter

Table 1: FC-113 HDMI to SD/HD-SDI Converter Features

#	Feature	Function
1	*HDMI IN* Connector	Connect to an HDMI source
2	*SD/HD-SDI OUT 1* BNC Connector	Connect to an SD or HD-SDI acceptor 1
3	*SD/HD-SDI* OUT 2 BNC Connector	Connect to an SD or HD-SDI acceptor 2
4	*5V DC*	+5V DC connector for powering the unit
5	*SD/HD* LED	Lights green for an SD input signal and blue for an HD-SDI input signal
6	*IN* LED	Lights green to indicate an HDMI signal
7	*ON* LED	Lights green when receiving power

5 Connecting the FC-113 HDMI to SD/HD-SDI Converter

To connect[1] the **FC-113**, as illustrated in Figure 2:

1. Connect an HDMI source (for example, a video camera) to the HDMI IN connector.
2. Connect the SD/HD-SDI OUT 1 connector to an acceptor (for example, a non-linear editor).
3. Connect the SD/HD-SDI OUT 2 connector to a digital display.
4. Connect the 5V DC power adapter to the power socket and connect the adapter to the mains electricity (not illustrated in Figure 2).

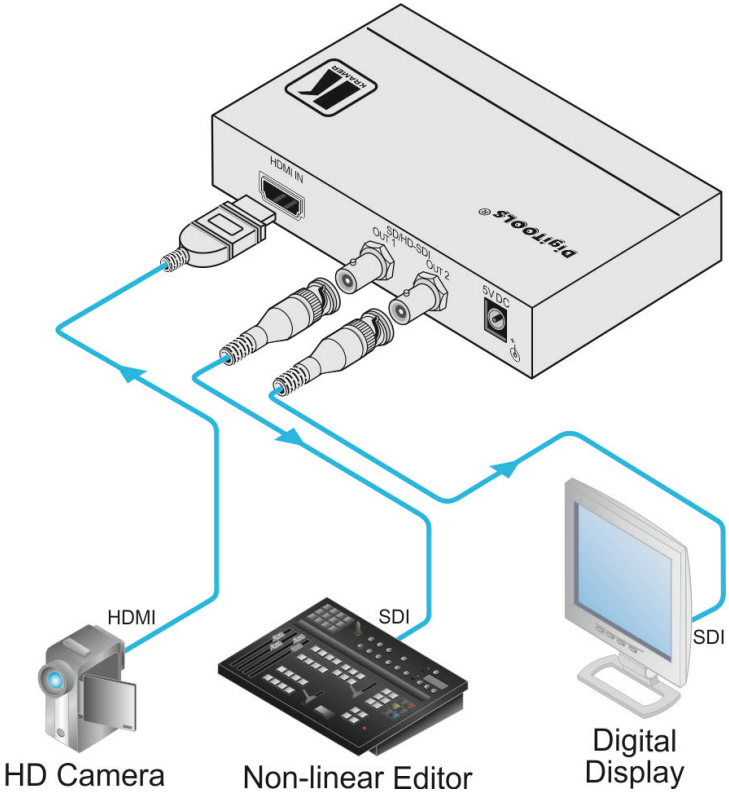


Figure 2: Connecting the FC-113 HDMI to SD/HD-SDI Converter

1 Switch off the power on each device before connecting it to your FC-113. After connecting your FC-113, switch on its power and then switch on the power on each device

6 Technical Specifications

The **FC-113** technical specifications are shown in Table 2:

Table 2: Technical Specifications[1] of the FC-113 HDMI to SD/HD-SDI Converter

INPUT:	1 HDMI connector
OUTPUTS:	2 SD/HD-SDI, 3G HD-SDI on BNC connectors
INPUT FORMATS:	525i, 625i 1080p @23.98/24/25/29.97/30/50/59.94/60 1080i @50/59.94/60 720p @50/59.94/60
OUTPUT FORMATS:	SMPTE-259M/292M/424M
MAX DATA RATE:	Up to 3Gbps
STANDARD COMPLIANCE:	HDMI
INDICATOR LEDS:	SD/HD, OUT, ON
POWER SOURCE:	5V DC, 440mA
DIMENSIONS:	12cm x 7.2cm x 2.4cm (4.7" x 2.8" x 1.0") W, D, H
WEIGHT:	0.3kg (0.67lbs)
ACCESSORIES:	Power supply
OPTIONS:	19" rack mount adapter

1 Specifications are subject to change without notice

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: "Radio frequency devices Subpart B Unintentional radiators"

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

* FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors visit www.kramerelectronics.com **where updates to this user manual may be found. We welcome your questions, comments and feedback.**

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

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P/N: 2900-000528 REV 4